

Some Azoxy Compounds as Reagents for Cations S/075/60/015/006/003/018
B020/B066

SUBMITTED: September 28, 1959

Card 4/4

5.3610

77906

SOV/79-30-2-57/18

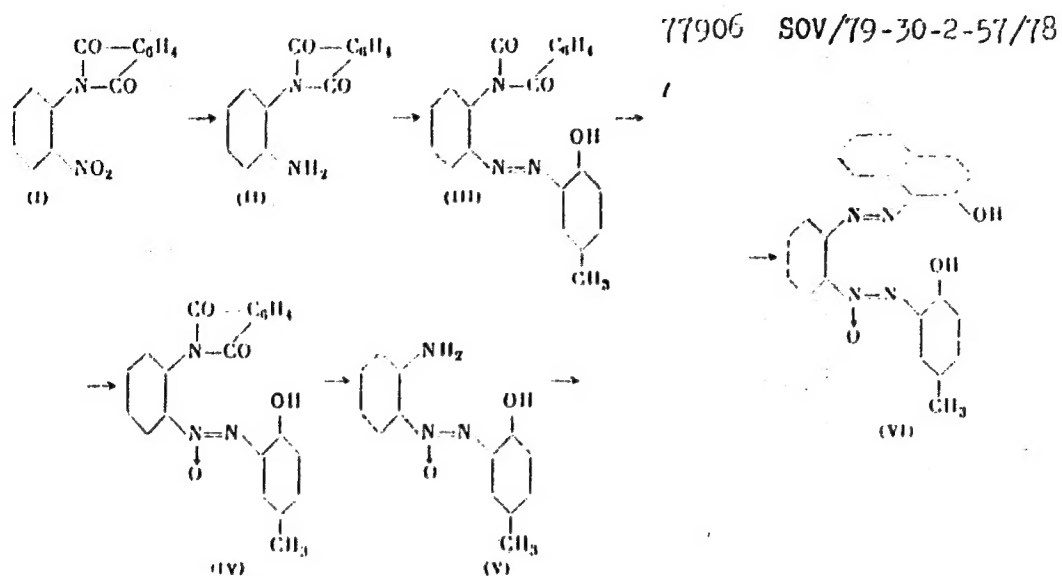
AUTHORS: Dziomko, V. M., Dunayevskaya, K. A.

TITLE: Synthesis of Chelating Agents of the Azoxy-Compounds Series. I. The First Representative of o/o"-Dihydroxy-o-Azoazoxy Compounds

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 2, pp 628-632 (USSR)

ABSTRACT: Chelating agents with increased selectivity can be obtained from o-amino-o'-hydroxyazoxybenzene derivatives. The article describes the synthesis of this new compound and the new o/o-dihydroxy-o-azoazoxy compound VI which was obtained as described in Fig. 1. Compound I was obtained on heating o-nitroaniline with phthalic anhydride in the presence of a small amount of nitrobenzene. Amine II was obtained on reduction of I with iron in aqueous acetone solution in the presence of acetic acid. Diazotization of II by the method

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Fig. 1.

Synthesis of Chelating Agents of the
Azoxy-Compounds Series. I. The First
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-Azoazoxy Compounds

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described by E. D. Bermann and M. Bentov (J. Org. Ch., 1954, Vol 19, p 1594), and coupling with p-cresol in methanol gave the new 2-phthaloylamino-2'-hydroxy-5'-methylazobenzene (III; yield 56-61%; mp 160-162° C). The oxidation of III in glacial acetic acid with 30% hydrogen peroxide at 70-80° C gave new 2-phthaloylamino-2'-hydroxy-5'-methylazoxybenzene (IV; yield 57-61%; mp 154-155° C), which on hydrolyzation in methanol with hydrazine at 75-80° C yielded new 2-amino-2'-hydroxy-5'-methylazoxybenzene (V; mp 126° C). The latter (in filtrate obtained after the hydrolysis of IV) was diazotized with excess sodium nitrate. The excess was eliminated with urea. The coupling of V with 2-naphthol in 20% NaOH was made in an alkaline (Na₂CO₃) medium. The dye thus formed was mixed with dilute (1:1) HCl, reprecipitated (by acidification of the alkaline alcohol solution), and recrystallized

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Synthesis of Chelating Agents of the
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-Azoazoxy Compounds

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from benzene-butanol (1:1) mixture and from chloroform. The reaction gave new 2'-hydroxy-5'-methylbenzene-(1'-azoxy-1)-benzene-(2-azo-1'')-2-hydroxy-1-phenylene (VI; yield 13.2% based on IV; mp 229-230°C). Boiling VI in chloroform with aqueous solutions of Cu, Co, and Ca salts in an alkaline medium, changed the color of the chloroform layer from pinkish-orange to crimson for Cu, to brownish-purple for Co, and to colorless for Ca. Copper complex of VI was obtained on adding copper acetate monohydrate in dilute NaOH to VI in chloroform. After 1 hr stirring and 12 hr standing, the copper complex was washed with water and recrystallized from dioxane (VII; decomp. about 300°C). Light absorption curves of VII and VI were taken by M. P. Khoroshkova. There is 1 figure; and 7 references, 2 U.S., 1 Austrian, 4 German. The 2 U.S. references are: E. D. Bergmann, M. Bentov, J. Org. Chem., 19, 1594 (1954); *ibid.*, 20, 1684 (1955).

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Synthesis of Chelating Agents of the
Azoxy-Compounds Series. I. The First
Representative of o,o-Dihydroxy-o-
-Azoazoxy Compounds

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ASSOCIATION: All-Union Scientific Research Institute for Chemical
Reagents (Vsesoyuznyy nauchno-issledovatel'skiy
institut khimicheskikh reaktivov)

SUBMITTED: February 20, 1959

Card 5/5

86508

5.3760 2209, 1282, 1308

S/079/60/030/011/014/026
B001/B066

AUTHORS: Dziomko, V. M. and Dunayevskaya, K. A.

TITLE: Synthesis of Chelating Agents in the Series of Azoxy Compounds. II. A Novel Synthesis of 2-(2'-Amino-phenyl-azoxy)-4-methyl-phenol and Synthesis of 2-(2'-Bromo-phenyl-azoxy)-4-methyl-phenol

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 11, pp.3708-3711

TEXT: The authors reported previously (Ref.1) on the synthesis of 2-(2'-amino-phenyl-azoxy)-4-methyl-phenol (III) by means of hydrazinolysis of 2-(2'-phthaloyl-amino-phenyl-azoxy)-4-methyl-phenol. They considered the papers (Refs.3,4) on the catalytic reduction of 2-nitro-phenyl-azoxy-benzene to 2-amino-phenyl-azoxy-benzene, and tried to apply this method to the azoxy compounds which may result on oxidation of 2-nitro-2'-hydroxy-5'-methyl-azo-benzene (I). In the oxidation of this compound (I) with peracetic acid, only one azoxy compound (II) was separated which gave the corresponding amine on reduction with hydrogen in the presence of platinum oxide, which was identified as 2-(2'-amino-phenyl-azoxy)-4-

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Synthesis of Chelating Agents in the Series S/079/60/030/011/014/026
of Azoxy Compounds. II. A Novel Synthesis of B001/B066
2-(2'-Amino-phenyl-azoxy)-4-methyl-phenol and Synthesis of 2-(2'-Bromo-phenyl-azoxy)-4-methyl-phenol

methyl-phenol (III). To confirm this structure, compound (III) was converted to 2-(2'-bromo-phenyl-azoxy)-4-methyl-phenol (IV) by Sandmeyer's reaction, which could be identified with the oxidation product of 2-bromo-2'-hydroxy-5'-methyl-azo-benzene (V). Both products are readily brominated with the theoretical bromine quantity, which also confirms the correctness of the suggested structures, in which the oxygen of the azoxy groups is bound to the nitrogen which is in ortho-position to the hydroxyl. There are 6 references: 1 Soviet, 3 British, and 2 Italian.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov (All-Union Scientific Research Institute of Chemical Reagents)

SUBMITTED: January 1, 1960

Card 2/2

DZIAMKO, V.M.

Extraction with the aid of two complex-forming substances.
Dokl.AN SSSR 133 no.1:106-107 J1 '60. (MIRA 13:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov. Predstavleno akademikom I.V. Tumanovym.
(Extraction(Chemistry)) (Chelates)

S/020/60/134/005/C33/C35XX
B016/B054

AUTHOR: Dziomko, V. M.

TITLE: Extraction With the Aid of Three Chelate¹Formers

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 5,
pp. 1091-1093

TEXT: The author reports on the observed cases of an extraction of colored compounds in the presence of three different chelate formers. He used the following reagents as chelate formers: 4-nitro-2,2'-dihydroxy-5'-methyl azobenzene (I), 4-nitro-2,2'-dihydroxy-4'-methyl-5'-isopropyl azobenzene (II), 8-hydroxyquinoline (III), 2-methyl-8-hydroxyquinoline (IV), 5-methyl-8-hydroxyquinoline (V), mono-n-butyl phosphate (VI), di-n-butyl phosphate (VII), N-nitroso-phenyl hydroxylamine (VIII), acetoacetic ester (IX), 2-carbethoxy cyclopentanone (X), 2-hydroxy acetophenone (XI), and benzoyl salicyloyl methane (XII). The extraction was carried out with chloroform. The extraction of colored (pink or violet) compounds was observed in the following cases at pH 10-12, and in the presence of three reagents: for scandium with combinations of II, VII, IX (or X); for

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Extraction With the Aid of Three Chelate
Formers

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yttrium and rare earths with I, IV, XII; I (or II), IV (or V), VI; II, III (or IV or V), VII; II, III (or V), XI (or X); II, VII, IX (or X); for thorium with combinations of I, V, VIII; I, VII, XI; II, IV, VIII; II, III (or IV or V), VII; II, VII, IX (or X). In control tests where either the cation or one of the reagents, in succession, was left out, the extracts were colorless. With several combinations the colored complexes were not extracted, e.g. with II and IX in the case of rare earths, and with I and VIII in the case of scandium in the presence of IV; further with double combinations with I or II, and with the reagents IV, III, and V in the case of thorium. The reason for the anomalous behavior of IV may be a steric hindrance of the chelate former (Ref. 3). At pH values between 6 and 8, the orange-yellow color of I or II changed to the orange-red or red of the extracted complexes, so in the case of yttrium, rare earths, and thorium with the combination I, III (or IV or V), VI. In some cases, the color was both intensified and bathochromically shifted, as compared with double combinations, in the presence of the third chelate former. Special experiments of the author proved that the quantitative ratio of the reagents, particularly with relatively low concentrations, greatly influences the extractibility of the corresponding colored compounds.

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Extraction With the Aid of Three Chelate
Formers

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B016/B054

Thus, the selectivity of the extraction of colored compounds of rare earths could be much improved by a decrease in concentration of IV in the system I, IV, and XII at pH 10-12. As to the extraction mechanism, the author supposes that the reagents of type I and II, under given conditions, form chelate compounds in the presence of at least two donor groups, since the extracts have the color of the deprotonized form of the corresponding reagent. It is possible that, among the reasons for a selective extraction in the presence of three chelate formers, a certain role is played by the increase in specificity of the particles in the gradual chelate formation of tri- and tetravalent cations. There are 7 non-Soviet references.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy Institut khimicheskikh reaktivov (All-Union Scientific Research Institute of Chemical Reagents)

PRESENTED: June 2, 1960, by A. N. Frumkin, Academician

SUBMITTED: May 30, 1960

Card 3/3

DZIOMKO, V.M.

Extraction by means of two chelating agents. Zhur.VKHO 6
no.1:108 '61. (MIRA 14:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov.

(Chelating compounds)

DZIAMKO, V.M.; DUNAYEVSKAYA, K.A.

Synthesis of chelants in the series of azoxy compounds. Part 3:
New synthesis of 2-(2-aminophenylazoxy)-4-methylphenol and a more
accurate determination of its structure. Zhur. ob. khim. 31 no.1:
68-73 Ja '61. (MIRA 14:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktovov.

(Azoxy compounds)

(Chelating agents)

DZIOMKO, V.M.; MUNAYEVSKAYA, K.A.

Relationship between isomeric azoxy compounds formed in the
oxidation of o, o'-disubstituted azo compounds. Zhur.ob.khim.
31 no.10:3385-3393 0 '61. (MIRA 14:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov.

(Azoxy compounds) (Azo compounds)

DZIAMKO, V.M.; DUNAYEVSKAYA, K.A.

Synthesis of chelates in the azoxy compound series. Part 3: Synthesis of (6"-oxy-3"-methylphenylazoxy)-benzene-(2--azo-1)-2-naphthol. Zhur. ob. khim. 31 no. 11:3712-3714 N '61. (MIRA 14:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov.

(Azoxy compounds)

DZIOMKO, V.M.; KRASAVIN, I.A.

8-(p-Toluenesulfonylamino)-quinoline (8-p-tosylaminquinoline).
Metod.poluch.khim.reak.i prepar. no.4/5:67-69 '62. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov i osobo chistyykh khimicheskikh veshchestv.

KRASAVIN, I.A.; DZIOMKO, V.M.

8-(benzenesulfonylamino)quinoline. Metod.poluch.khim.reak.i prepar.
no.4/5:69-71 '62. (MIRA 17:4)

1. V soyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov i osobø chistykh khimicheskikh veshchestv.

ROZINA, D.Sh.; DZIOMKO, V.M.; ROZENBERG, R.I.

Azotol 2,4 MK (3-carboxy(-2,4-dimethylanilido)-2-hydroxynaphthalene). Metod.poluch.khim.reak.i prepar. no.4/5:103-105 '62.

2-Hydroxybenzene-(1-azo-1')-2'hydroxy-3'-(2",4"-dimethyl-carboxyanilido)-naphthalene ("magon," "oban"). Ibid.:106-109

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv.

DZIOMKO, V.M. (Moscow, Bogorodskiy val.d.3); DUNAYEVSKAYA, K.A. (Moscow, Bogorodskiy val.d.3)

Highly selective reagents among multidentate chelates. Acta chimica Hung 32 no.2:223-227 '62.

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov.

DZIOMKO, V.M.; MARKOVICH, I.S.

Synthesis of 2-(2'-aminophenyl)-8-hydroxy-4,5,7-trimethylquinazoline.
Zhur.ob.khim. 32 no.5:1622-1626 My '62. (MIRA 15:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov.

(Quinazoline)

VAYNSHTEYN, Yu.I.; DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.; SHIROKOVA, M.D.

Polarographic study of ortho-substituted azoxy compounds. Part 1.
Zhur.ob.khim. 32 no.9:2777-2782 S '62. (MIRA 15:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov i osobo chistykh khimicheskikh veshchestv.
(Azoxy compounds) ~ (Polarography)

KRASAVIN, I.A.; PARUSNIKOV, B.V.; DZIOMKO, V.M.

8-Hydrazinoquinoline and its hydrochloride. *Metod. poluch. khim. reak.*
1 prepar. no. 7:5-8 '63. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov i osobo chistykh khimicheskikh veshchestv.

DZIAMKO, V.M.; KRASAVIN, I.A.; RADIN, Yu.P.

8-Acetoxyquinoline. Metod.poluch.khim.reak. i prepar. no.7:
8-10 '63. (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov i osobo chistykh khimicheskikh veshchestv.

DZIONKO, V.M.; RUDENKO, N.P.; KREMENSKAYA, I.N.

Mixed thorium complex with cupferron and 4'-nitroso-2,2'-dihydroxy-4-methyl-5-isopropylazobenzene. Zhur.neorg.khim. 8 no.3:655-659 Mr '63.

(MIRA 16:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i laboratoriya radiokhimii Nauchno-issledovatel'skogo instituta yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Thorium compounds) (Cupferron) (Azobenzene)

DZIOMKO, V.M.; RUDENKO, N.P.; KREMENSKAYA, I.N.

Determination of the composition of the complex thorium^(IV)-
cupferron-4'-nitro-2,2'-dihydroxy-4-methyl-4-isopropylazobenzene.
Zhur.neorg.khim. 8 no.5:1278-1280 My '65. (MIRA 16:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov i Nauchno-issledovatel'skiy institut yadernoy fiziki
Moskovskogo gosudarstvennogo universiteta, laboratoriya radiokhimii.
(Thorium compounds) (Cupferron)
(Azobenzene)

DZiomko, V.M.; Krasavin, I.A.

Synthesis of pyrazole derivatives containing bidentate
complex-forming groups. Trudy IREA no.25:41-46 '63.
(MIRA 18:6)

DZIAMKO, V.M.; MARKOVICH, I.S.; ZELICHENOK, S.L.

Color reactions of quinazoline multidentate derivatives. Trudy
IREA no.25:47-56 '63. (MIRA 18:6)

DZIOMKO, V.M.; RUDENKO, N.P.; KREMENSKAYA, I.N.

Mixed cyclocomplex formation in the system thorium (IV) -
cupferron - 4'-nitro-2,2'-dihydroxy-4-methyl-5-isopropyl-
zobenzene. Trudy IREA no.25:172-182 '63.

(MIRA 18:6)

DZIAMKO, V.M.

New cases of the extraction of mixed chelates. Trudy IREA no.25:
183-186 '63. (MIRA 18:6)

DZIAMKO, V.M.; DUNAYEVSKAYA, K.A.

Synthesis of extraction agents forming colored mixed chelates.
Trudy IREA no.25:187-190 '63. (MIRA 18:6)

L 18300-63

EWP(q)/EWT(m)/BDS

AFFTC/ASD

RM/JD/JG

ACCESSION NR: AP3004943

S/0075/63/018/008/0937/0941

AUTHORS: Dziomko, V. M.; Zelichenok, S. L.; Markovich, I. S.

TITLE: Photometric determination of lithium with a new reagent - Quinazolinazo

SOURCE: Zhurnal analiticheskoy khimii, v. 18, no. 8, 1963, 937-941.

TOPIC TAGS: dimethylformamide, Sr, Ca, Mg, Na, Ba, Al, Fe, Rb, Cs

ABSTRACT: A photometric method was developed for lithium determination with the aid of a new reagent 2-(4",5"-dimethylimidazole-2"-azo-2'-phenyl)-8-hydroxy-4,5,7-trimethylquinazoline. The coefficient of molar extinction of the product of interaction of the reagent with lithium in dimethylformamide is 12,840. The sensitivity of the reagent is 0.1 µg of lithium in 5.75 ml of solution. Fifty times as much of Ca, Sr and Mg, 100 times as much of Na, Ba, Al and Fe, 200 times as much of Rb and Cs do not interfere with lithium determination. Curves presented include: The absorption curve of 3.45×10^{-5} M quinazolinazo solution depending on concentration of KOH in solution; dependence of photoabsorption of quinazolinazo and its lithium compound from KOH concentration in solution; luminous absorption curves of 6.95×10^{-5} M reagent solution and its lithium compound. Orig. art. has: 5 figures.

ASSN: AU SCI. RES. INST. CHEM. REAGENTS AND CHEM. SUBSTANCES OF SPECIAL PURITY.

Card 1/2

LARIN, G.M.; DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.

Electron paramagnetic resonance of copper 2-(2"-hydroxynaphthalene
[1"-azc-2"]-phenylazoxy)-4-methylphenolate. Zhur. strukt. khim. 5
no.5:783-785 9-0 '64 (MIRA 18:1)

1. Institut obshchey i neorganicheskoy khimii imeni N.S.Kurnakova
AN SSSR i Institut khimicheskikh reaktivov i osobo chistykh
veshchestv.

"APPROVED FOR RELEASE: 03/13/2001

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CIA-RDP86-00513R000411920011-2"

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CIA-RDP86-00513R000411920011-2

APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000411920011-2"

KREMEŇSKAYA, I. N.; BRUDZ, V. G.; AVILINA, V. N.; IVANOV, O. V.; EZIOŇKO, V. M.

"Physikalisch-chemische Untersuchung von Mikroverunreinigungen in nichtwässrigen nichtmischbaren Systemen der Chloride der IV. Gruppe."

report submitted for 2nd Intl Symp on Hyperpure Materials in Science and Technology, Dresden, GDR, 28 Sep-2 Oct 65.

All-Union Inst für reine Reagentien und Reinststoffe, Moskau.

RULENKO, N.P.; DZIOMKO, V.M.; KHEMENSKAYA, I.N.

Use of mixed chelate formation for concentrating thorium traces.
Trudy Kom. anal. khim. 15:96-100 '65. (MIRA 18:7)

LARIN, G.M.; DZIOMKO, V.M.; DUNAYEVSKAYA, K.A.; SYRKIN, Ya.K.

Electron paramagnetic resonance of some inner-complex compounds
of copper (II). Zhur. struk. khim. 6 no.3:391-396 My-Je '65.

(MIRA 18:8)

1. Institut obshchey i neorganicheskoy khimii imeni N.S.Kurnakova
AN SSSR i Institut khimicheskikh reaktivov i osobo chistykh
khimicheskikh veshchestv.

RUDENKO, N.P.; DZ IOMKO, V.M.; KRFEMENSKAYA, I.N.

Method of separating Zr^{95} from Nb^{95} by the extraction of zirconium as a mixed complex with 8-hydroxyquinoline and caproic acid. Radiokhimiya 7 no.4:492-494 '65.

(MIRA 18:8)

DZION, W; Dahlman, A.

Concerning the remarks of M. Domasik on the articles "The Problem of Spare Parts in the Repair of Building Machinery" and "The Production and Distribution of Spare Parts in Building Construction."

P. 31 (BUDOWNICTWO PRZEMYSLOWE) Poland, Vol. 6, No. 7, July 1957

SO: Monthly Index of East European Accessions (AEEI) Vol. 6, No. 11, November 1957

DZIONDZIAK, S.

Contribution to a discussion on the reinforced glass cutting machine. p.54. (SZKLO I CERAMIKA, Warszawa, Vol. 6, No. 3, Mar. 1955)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 6, June 1955, Uncl.

ATAULIN, V.V.; VLASOVA, R.M.; DAVYDOVA, Ye.A.; DANILENKO, I.S.; DZIOV, V.A.;
 DUBROVIN, A.P.; YEFANOVA, L.V.; KARPENKO, L.V.; KLEPIKOV, L.B.;
 KOTRELEV, S.V.; LUK'YANOV, N.I.; MEL'NIKOV, N.V., prof., obshchiy
 red.; MKRTYCHAN, A.A.; NEMTINOV, A.M.; POGOSTANTS, V.K.; SEMIZ,
 M.D.; SKOBLO, G.I.; SLOBODCHIKOV, P.I.; SMIRNOV, V.M.; SUSHCHENKO,
 A.A.; SOKOLOVSKIY, M.M.; TRET'YAKOV, K.M.; FISH, Ye.A.; TSOY, A.G.;
 TSYPKIN, V.S.; CHEKHOVSKOY, P.A.; CHIZHIKOV, V.I.; ZHUKOV, V.V.,
 red.isd-va; KOROVENKOVA, Z.L., tekhn.red.; PROZOROVSKAYA, V.L.,
 tekhn.red.

[Prospects for the open-pit mining of coal in the U.S.S.R.; studies
 and analysis of mining and geological conditions and technical and
 economic indices for open-pit mining of coal deposits] Perspektivy
 otkrytoi dobychi uгля v SSSR; issledovanie i analiz gornogeologi-
 cheskikh uslovii i tekhniko-ekonomicheskikh pokazatelei otkrytoi
 razrabotki ugol'nykh mestorozhdenii. Pod obshchei red. N.V.Mel'-
 nikova. Moskva, Ugletekhnizdat, 1958. 553 p. (MIRA 11:12)

1. Vsesoyuznyy tsentral'nyy gosudarstvennyy proyektnyy institut
 "Tsentrorgiproshakht." 2. Chlen-korrespondent AN SSSR (for Mel'-
 nikov).

(Coal mines and mining)

DZIOYEV, I.M., inzh.

Using hoisting machinery in building blast furnaces. Prom. stroi.
37 no.4:57-62 Ap '59. (MIRA 12:6)

1. YushNII.

(Blast furnaces) (Hoisting machinery)

DEIPAIISKI, M.

Solving some problems placed by practice, p. 83.

AMERISKI PRŮVLED. (Ministerstvo na narodnata otbrana) Sofia, Czechlovakia.
Vol. 5, no. 6, 1956.

Monthly List of East European Accessions (EEAI), LC, Vol. 9, No. 2, Feb. 1960
Uncl.

DZIRKALIS, R.

Wide outlook for swine raising!

p. 1 (Padomju Latvijas Kolchoznieks) Vol. 9, No. 8, Aug. 1957. Riga, Latvia

SO: Monthly Index of European Accession (EEAI) LC, -Vol. 7, No. 1, Jan. 1958

DZIS', G.V. [Dzis', H.V.]; KUZNETSOV, K.M. [Kuznietsov, K.M.]

Production potentials of the light industry of the Ukrainian S.S.S.R.
Ish.prom. no.2:3-6 Ap-Je '65. (MIRA 18:10)

VASILENKO, A.G.; NOGACHEVSKIY, I.I.; DZIS', I.P.

Interrelations of autoinfection and leukopenia and connective
tissue mast cell reactions in radiation injury. Med. rad. 5
no.12:72-73 '60. (MIRA 14:3)
(RADIATION SICKNESS) (LEUKOPENIA)
(MAST CELLS)

KISIN, S.V., prof.; DZIS', I.P., assistant

Rare case of combination of bilateral polycystic kidney with atresia
of the ureters, paranephric cyst, and ascites in a newborn child.

Ped., akush. 1 gin. 22 no.4:2 of cover '60. (MIRA 14:5)

(KIDNEYS--DISEASES) (ASCITES)

(URETERS--ABNORMALITIES AND DEFORMITIES) (CYSTS)

(INFANTS (PREMATURE))

DZIS', I.P.

Reaction of the cellular elements of porous connective tissue
of white mice in experimental salmonellosis. Arkh. pat. 23 no.2:
29-33 '61. (MIRA 14:2)

(SALMONELLA)

(CONNECTIVE TISSUE)

PETROV, D.G.; SAVCHIK, A.B.; DZIS', I.P.; BAYDAK, V.I.

Morphological and biochemical changes in homologous skin following
thermal treatment with formalin. Gemat. i perel. krovi 1:156-160
'65.

(MIRA 18:10)

1. L'vovskiy institut perelivaniya krovi.

DZIS', G.V. (Dzys', H.V.), inzh.-mekhanik

How we mechanized the preparation of peat-mineral composts. Mekh. sil'.
hosp. 11 no.7:24 J1 '60. (MIRA 13:10)

1. Pervyi sekretar' Olishchakovo raykoma Kommunisticheskoy partii
Ukrainy, Chernigovskoy oblasti.
(Compost)

MASIK, M.G., dotsent; DZIS', I.P.

Spontaneous rupture of the spleen in acute aleukemic myelosis. Vrach.
delo no.10:113-114 0 '60. (MIRA 13:11)

1. Kafedra propedevticheskoy terapii (zav. - dotsent M.G.Masik)
i kafedra patologicheskoy anatomii (zav. dotsent N.I.Val'chuk)
Teropol'skogo meditsinskogo instituta.
(MARROW--DISEASES)
(SPLEEN--RUPTURE)

DZISHKARIANI, A.V.

Estimates of the error of the Ritz method for proper values and
proper functions of a differential equation. Soob.AN Gruz.SSR
25 no.1:11-18 J1 '60. (MIRA 13:10)

1. Akademiya nauk Gruzinskoy SSR Tbilisskiy matematicheskiy institut
im. A.M.Razmadze. Predstavleno chlenom-korrespondentom Akademii
nauk N.P.Vekua.

(Differential equations)

DZISIEŃSKI, Z.

Equipment for grinding self-centering jaws for lathes. p.314.

MECHANIK (Stowarzyszenie Inżynierów i Techników Mechaników Polskich) Warszawa

Vol. 28, no. 8, Aug. 1955

So. East European Accessions List

Vol. 5, No. 9

September 1946

DZISIEWSKI, Z.

DZISIEWSKI, Z. The development of the tool industry according to the 5-Year Plan. p. 274. Vol 29, no. 7, July 1956. MECHANIK, Warszawa, Poland.

DZISICW, F.
5907

Physiol. Inst. of the Med. Faculty, Univ. of Lodz Intravenous glucose transformation during severe muscular exercise in normal dogs Proceedings of the Society for Experimental Biology and Medicine 1948, 68/3 (549-550)

With an injection rate of 4 g./kg/hour glucose elimination by dogs performing work becomes inappreciable towards the end of the experiment, whereas in resting animals even with a rate of 2 g/kg/hour such an improvement of glucose utilization is not achieved.

Gottschalk - Melbourne

SO: EXCERPTA MEDICA, Vol. II, No. 11, Sec. II, Nov. 1949

DZISIOU, Ferdynand

Effect of muscular work on glycemic curve in cases of primary chronic rheumatism. Polskie arch. med. wewn. 27 no.3:311-317 1957.

1. Z Instytutu Reumatologicznego: Dyrektor: prof. dr. med.
E. Reicher Oddzial Krakow: Dyrektor: prof. dr. med. A. Sabatowski.
Kierownik dzialu klinicznego: prof. dr. med. A. Sokolowski.
Adres autora: Krosno nad Wislokiem, ul. W. Proletariatu 6.

(ARTHRITIS, RHEUMATOID, blood in,
sugar, eff. of exercise (Pol))

(EXERCISE, effects,
on blood sugar in rheum. arthritis (Pol))

DEISION, Ferdynand.

Investigations on assimilation of dextrose by muscles of the forearm in chronic rheumatism. Pat.polska 6 no.4:267-279 Oct-Dec 55.

1. Z Instytutu Reumatologicznego w Warszawie. Dyrektor: prof. dr. B.Reicher, Oddzial Krakow. Dyrektor: prof. dr. A.Sabatowski. Kierownik Oddzialu Klinicznego: doc. dr. A.Sokolowski.

(ARTHRITIS, RHEUMATOID, metabolism in,

musc. glucose assimilation (Rus))

(MUSCLES, metabolism,

glucose assimilation in rheum. arthritis (Rus))

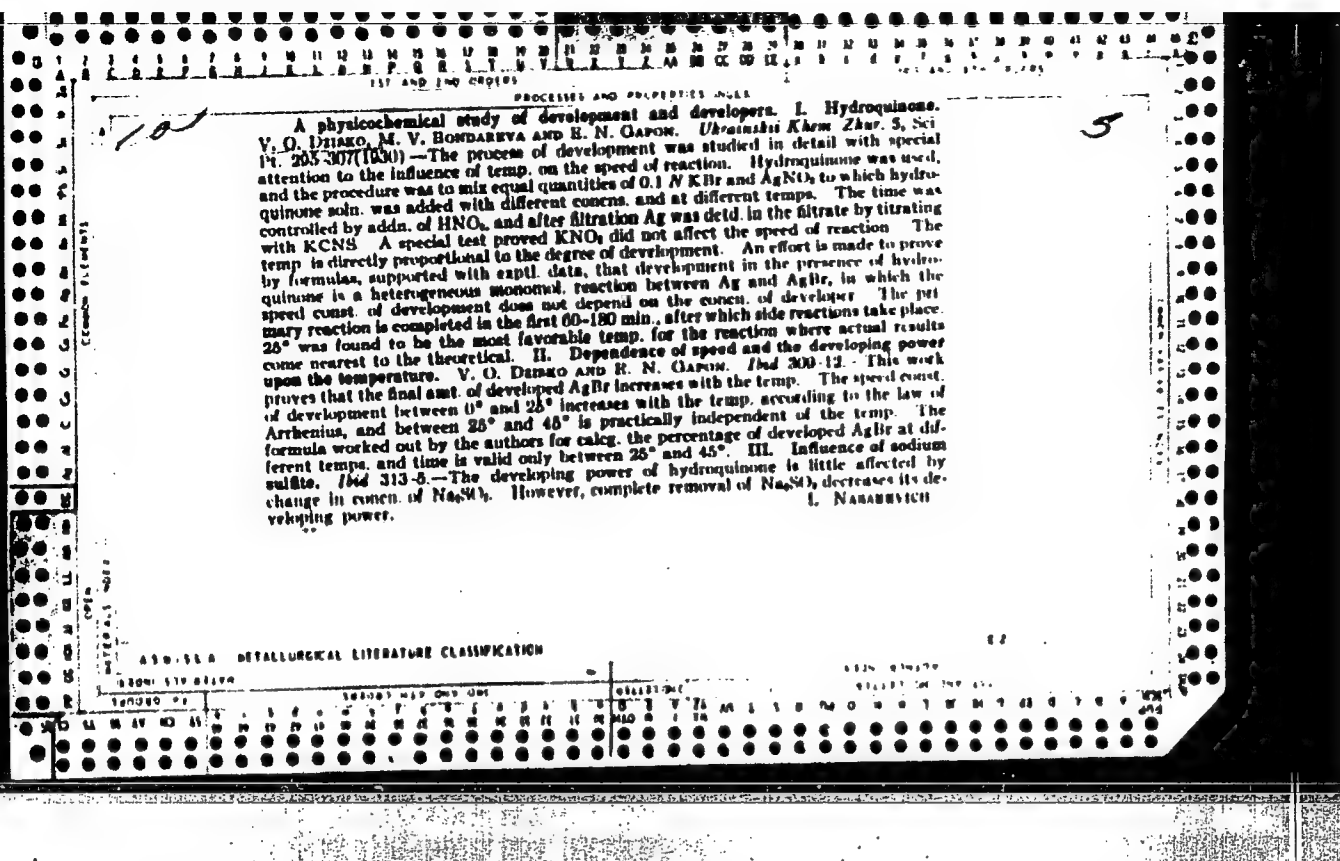
(GLUCOSE, metabolism,

musc., assimilation in rheum. arthritis (Rus))

EXCERPTA MEDICA Sec 6 Vol 13/10 Internal Ind Oct 59
5940. RESEARCHES ON THE METABOLISM OF CARBOHYDRATES IN RHEU-
MATOID ARTHRITIS - Dziśiów F. State Inst. of Rheumatol., Warsaw;
Cracow Branch, Clin. Dept., Cracow - ACTA RHEUM. SCAND. 1958, 4/3
(193-199) Graphs 4

After oral administration of glucose the rheumatoid arthritis patients show a delay
in the return to initial values. The difference between the blood sugar in the
capillaries and the veins is considerably below normal figures in the patients while
resting as well as during work. Moderate effort in the fasting state provokes hyper-
glycaemia. These deviations can be accounted for by a disturbance in the neuro-
vegetative balance.

Pojer - Brno (VI, 19*)



CA 5

physicochemical study of the process of development and the developers. IV. V. O. DZINKO AND R. N. GARDIN. *J. Gen. Chem. (U.S.S.R.)* 1, 1170-MX(1931); cf. C. A. 25, 515M. The reducing powers of pyrocatechol, of hydroquinone and of metal were studied at 25° as described in the earlier articles. Metal was the most efficient, hydroquinone being next. Similarity was sought between the development and crystal by observing the diffusion development. A glass tube filled with sensitive emulsion was exposed to light and then immersed in the developer in the dark, the characteristic layers of the diffusion development were produced. The work is to be continued. [R. N. GARDIN]

ASAC SLA METALLURGICAL LITERATURE CLASSIFICATION

The function of carriers in heterogeneous catalysts. I. Oxidation of arsenious oxide on charcoal bearing copper oxide. I. E. ADADUROV AND V. A. DZHAZKO. *J. Phys. Chem.* (U. S. S. R.) 3, 480-84 (1932). —Addn. of CuO to the catalyst increased the conversion of As₂O₃ to As₂O₅ from 7% to 31% with inactive charcoal, and from 42% to 98% with activated charcoal. II. Dehydrogenation of ethyl alcohol. I. E. ADADUROV AND P. YA. KRAVCH. *Ibid* 400-506. —The conversion of EtOH to CH₃CHO by charcoal surfaces at 350° begins only after 2 Cu atoms are present for each C atom and then increases very rapidly to 84% on pure Cu. For the at. ratios, Cu:C, 2 R, 4 R and ∞ the heats of activation are, resp., 37.7, 28.0 and 17.0 cal. F. H. RATHBURN

DZIS'KO, V. A.

USSR/Chemistry- Silica, Colloidal
Chemistry- Absorption

May 1948

" Influence of the Conditions of Preparation on the Structure of Silica Gel," G. K. B oreskov, M. S. Borisova, O. M. Dzhigit, V. A. Dzis'ko, V. P. Dreving, A. V. Kiselev, O. A . Likhacheva, Moscow S tate U imeni M. V. Lomonosov, Phys Chem Inst imeni L. Ya. Karpov, Moscow, 14 pp

" Zhur Fiz Khim" Vol XXII, No 5

S amples of various types of silica gel (vitreous, chalky, etc.) obtained by different methods and their absorbent properties compared. Results are tabulated and shown graphically. Submitted 14 Aug 1947.

PA 68T24

DZISKO, V. A.

Oct 48

USSR/Physics
Silica Gels
Temperature

"Effect of the Ignition Temperature on the Structure of Silica Gels," G. K. Boreskov, M. S. Borisova, V. A. Dais'ko, A. V. Kiselev, O. A. Likhacheva, T. N. Morokhovets, Moscow State U imeni M. V. Lomonosov, Physicochem Inst imeni Karpov, 3 2/3 pp

Dokl AK Nauk SSSR Vol 62, No 5

Three types of silica gel prepared: 1, glasslike samples with fine pores; 2, glasslike samples with uniformly coarse pores; and 3, chalklike samples of mixed porosity. Tests of adsorption and of desorption of methyl alcohol vapors yielded isotherms showing that 12-hour periods of ignition temperatures from 115° to 1,000°C affected samples' adsorption properties differently. Fine-pore glasslike samples were least stable thermally. Chalklike samples showed highest stability. Submitted by Acad M. M. Dubinin, 11 Aug 48.

Pa 53/49T99

C A

Porosity and activity of catalysts. I. Hydrolysis of chlorobenzene on silica gels of various structures. G. K. Borekshov and V. A. Dzin'ko (Karpov Phys.-Chem. Inst., Moscow). *Zhur. Fiz.-Khim.* 24, 1135-46 (1950).—The relation between catalytic activity and catalyst porosity was studied on various samples of silica gel with the following characteristics (wt. of unit vol. of catalyst, pore vol., sp. surface area, av. pore radii): (I) 0.53 g./cc., 0.31 cc./g., 340 sq. m./g., 10 Å.; (II) 0.64 g./cc., 0.31 cc./g., 640 sq. m./g., 15-20 Å.; (III) 0.49 g./cc., 0.8 cc./g., 400 sq. m./g., 30-40 Å. The prepn. of the catalysts was described previously (C.A. 42, 7132d). The kinetics was studied in a flow system. The pressure was maintained const. between 100 and 150 mm. Before each run, lasting 4-6 hrs., fresh catalyst was used. PhOH and HCl were sampled and titrated at 20-min. intervals. All catalysts lose their activity more or less rapidly; this deactivation is more pronounced the higher the temp. or the finer the pores. Since all catalysts were preheated at temps. higher than the ones prevailing during the reaction, the activity decrease was due to stopping of the pores by carbonaceous material. The kinetic law is found by changing the concn. c of PhCl between 0.9 and 14%. H_2O is present in excess. There is a linear relation between $\log c$ and the contact time t . The slope of the straight lines is 0.5 so that either $-dc/dt = k_1 c^{0.5}$ or $-dc/dt = k_2 c^{0.5}$ where c_1 is the product concn. Since k_2 is more nearly const. than k_1 for c between 13 and 16%, the 1st law is preferred for the calcns. For all catalysts, the Arrhenius plot ($\log k_2, 1/T$) consists of 2 straight lines. The break in the Arrhenius line occurs, however, at different temps. for dif-

ferent catalysts, viz., 525° for I, 500° for II, and 585° for III. At these temps. the activation energy E (in kcal.) changes from 50.6 to 17.0 (I), from 40.7 to 34.3 (II), and from 50.9 to 36.3 (III). The higher E corresponds to the kinetic range, the lower E to the diffusion range. The activity per unit surface is the same for all catalysts in the kinetic range but varies from catalyst to catalyst in the diffusion range owing to different pore structures. In the latter range, the internal surface is less fully utilized and this effect is more pronounced for catalysts with finer pores. A coeff. of utilization of the internal surface is calcd. for the 3 catalysts on the assumption that diffusion into the pores is the rate-dtg. step at high temp. The activity per unit surface can be thus calcd. for various temps. in the diffusion range. The good agreement with the observed values substantiates the role attributed to the porous structure of a catalyst.

Michel Boudart

DETS'KO V. A.

Dec 50

USSR/Chemistry - Catalysis

"Effect of Thermal Processing on the Catalytic Activity of Silica Gel," V. A. Dzis'ko, A. A. Vishnevskaya, V. S. Chesalova, Physicochem Inst imeni L. Ya. Karpov, Lab of Tech Catalysis, Moscow

"Zhur Fiz Khim" Vol XXIV, No 12, pp 1416-1419

Calcined 2 glassy forms of silica gel of uniform porosity and 1 chalky form with nonuniform porosity at temperatures up to 1000°C. Structural water decreased with temperature. Degree of covering of surface by hydroxyl groups was independent of temperature. Catalytic activity in vapor-phase

170716

Dec 50

USSR/Chemistry - Catalysis (Contd)

hydrolysis of chlorobenzene decreased rapidly for glassy forms, more slowly for chalky form, latter retaining sufficient activity up to 1000°. Specific catalytic activity was independent of temperature for glassy forms, increased slightly with temperature for chalky form.

170716

USSR/Chemistry - Catalysts

Apr 52

"The Effect of Heat Treatment on the Structure and Catalytic Activity of Aluminum Oxide." G. K. Boreskov, V. A. Dzis'ko, M. S. Borisova, V. N. Krasnopol'skaya, Phys Chem Inst imeni L. Ya. Karpov, Moscow

"Zhur Fiz Khim" Vol XXVI, No 4, pp 492-499

Heating for 24 hrs at temps up to 600° does not change the surface and porosity of samples in comparison with those treated at 450°. At higher temps there are reduction of surface and changes of pore structure involving formation of larger pores.

(1)

217T23

The surface reduction proceeds much more rapidly than the decrease in pore vol. Samples of different initial pore structure exhibit different resistance to high temps, those with the finest pore structure being the most strongly affected. Although the total catalytic activity is lowered as a result of heat treatment, the specific activity (activity per unit of surface) is increased to some extent if the temp of treatment is below 1,200°. The reason is the effect exerted on int diffusion. The activity of a sample heat-treated at 1,000° is increased, because fine pores the surface of which remains unused in catalysis

(2)

217T23

disappear at 1,000°. This does not happen at lower temps. The specific activity of gamma-Al₂O₃ is not affected by the temp of heat treatment and does not depend on crystal size; only transformation into alpha-Al₂O₃ changes the nature of the surface. The data on catalytic activity are based on the reaction of ethyl alc dehydration.

(3)

217T23

DZIS'KO, V. A.

Effect of sodium hydroxide on the catalytic activity of aluminum oxide in relation to the decomposition of ethyl alcohol. G. K. Borekov, V. A. Dzis'ko, and M. S. Borisova (L. Ya. Karpov Phys.-Chem. Inst., Moscow). *Zhur. Fiz. Khim.* 27, 1172-5 (1953); cf. *C.A.* 42, 214. — The progressive poisoning of Al_2O_3 catalysts by NaOH was investigated. Samples of Al_2O_3 prepd. in 4 different ways were made to absorb various amts. of NaOH from soln., then dried and kept 1 hr. at 450°. The catalytic activity of each sample was detd. from the amt. of C_2H_4 produced when EtOH was passed over it at 420°. The total adsorption surface was detd. by means of a sorption balance with MeOH as the adsorbate. Sp. gr., vol. of micropores in cc./g., total surface in sq. m./g. and sq. m./cc., and total and specific catalytic activities of each of the initial samples are tabulated. The rate const. for the formation of C_2H_4 is shown graphically as a function of the amt. of adsorbed NaOH in millimoles/g. for each type of sample. The relative rate consts. are plotted as functions of the no. of millimoles of adsorbed NaOH per sq. cm. of adsorbing surface. The pore size and total surface of Al_2O_3 are unchanged by the NaOH treatment. The catalytic activity decreases as the amt. of adsorbed NaOH increases, most rapidly for the smallest amts. of NaOH. This probably corresponds to adsorption of NaOH mols. on active groups of the surface. It is concluded that the active regions comprise 5-10% of the total surface of the Al_2O_3 samples. The no. of active centers per unit surface depends on the purity of the sample and not on the manner of its prepn. J. W. L., Jr.

DZIS'KO, V. A.

9

Chemical Abstracts
May 25, 1954
General and Physical
Chemistry

Effect of ignition temperature on the extent of surface and on the water content of the oxides of aluminum and magnesium. G. K. Borekov, V. A. Dziskov, and M. S. Borisova (L. Ya. Karpov Phys.-Chem. Inst., Moscow). *Zhur. Fiz. Khim.* 27, 1170-88 (1953); *U.S.S.R.* 47, 1574. --In an investigation of the mechanism of catalysis in oxides the water content of Al_2O_3 and MgO was determined. The temp. of a sample of Al_2O_3 in vacuum was raised from 100 to 1200° during a 100-hr. period. The evolved H_2O was weighed by means of a sorption balance. The Al_2O_3 contained 17, 4.5, 1.1, and 0.5% H_2O at 20, 200, 600, and 1200°, resp. The surface was 245, 235, 127, and 10.5 sq. m. per g. at 450, 800, 1000, and 1200°, resp. On similar treatment $Mg(OH)_2$ was entirely converted to MgO below 370°; the rate of conversion was max. at 250°. The H_2O content and the surface of MgO at 400, 500, and 1000° were 2.0, 0.58, and 0.01%, resp., and 347, 86, and 11 sq. m. per g., resp. In both oxides, the water appears to be held in solid soln. above 400°. Exptl. data are tabulated and graphed. J. W. L., Jr.

DZIS'KO, V. A.

USSR/Chemistry - Decomposition

Card 1/1

Authors : Boreskov, G. K., Dzis'ko, V. A., and Yasevich, N. P.

Title : Effect of the composition of alumo-silicic catalysts on their activity in the process of ethyl alcohol decomposition

Periodical : Zhur. Fiz. Khim., 28, Ed. 5, 837 - 842, May 1954

Abstract : Experiments were conducted to determine the effect of the composition of alumo-silicic catalysts on their activity and selectivity in the process of ethyl alcohol decomposition. The activity relative to one aluminum atom on the surface is approximately the same for all investigated samples and does not depend upon the Al_2O_3 concentration in the catalyst. Results also indicate that the relation between the activity and composition of alumosilicic catalysts during the dehydration of the alcohol is entirely different from the relation existing during cracking, isomerization and other hydrocarbon conversion processes. Nine references: 5-USSR, 3-English and 1-USA. Tables, graphs, drawings.

Institution : The L. Ya. Karpov Physico-Chemical Institute, Moscow

Submitted : Aug. 18, 1953

DZIS'KO, V. A.

USSR/Chemistry Physical chemistry

Card : 1/1

Authors : Boreskov, G. K., Dzis'ko, V. A., and Borisova, M. S.

Title : Porous structure of catalysts and its effect on their reaction selectivity

Periodical : Zhur. fiz. khim. 28, Ed. 6, 1055 - 1066, June 1954

Abstract : Two cases of series reactions of the first order were investigated to determine the effect of porous structure of catalysts on their reaction selectivity. The rate of diffusion transfer, toward the internal surface of the catalyst grains and its effect on reaction selectivity, was also considered. The selectivity dependence upon the rate of diffusion was determined by criteria expressing the relation between the rate of chemical conversion and diffusion transfer for the basic substance and intermediate product. Four USSR references. Graphs.

Institution : The L. Ya. Karpov Physico-Chemical Institute, Moscow

Submitted : August 18, 1953

S/195/60/001/001/005/007
B015/B060

5.1190

AUTHORS: Dzis'ko, V. A., Borisova, M. S.

TITLE: Effect of the Acidity of Catalysts on Their Catalytic Activity I. Polymerization of Isobutylene 1

PERIODICAL: Kinetika i kataliz, 1960, Vol. 1, No. 1, pp. 144-152

TEXT: The authors studied the relationship between the acidity and the catalytic activity of the following oxide catalysts: $ZrO_2 \cdot SiO_2$,

$Al_2O_3 \cdot SiO_2$, $B_2O_3 \cdot Al_2O_3$, $MgO \cdot SiO_2$, and H_3PO_4 on SiO_2 . The acidity and the number of acid parts were determined by using the indicator method and eight different indicators with pK from + 6.8 to -8.2 (Table 1). The catalyst samples investigated were hydrated under standard conditions. Pure and mixed oxide catalysts were tested (Table 2), and it was found that the maximum acidity was not dependent on the concentration of the acid component in the mixed catalyst. The acidity function H_0 varied from +4 to -8.2. The effect of acidity on the catalytic activity was investigated in the range from $H_0 = -3$ to -8 on the polymerization of

Card 1/3

82655

Effect of the Acidity of Catalysts on Their
Catalytic Activity I. Polymerization of
Isobutylene

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B015/B060

isobutylene in a circulation apparatus (Fig. 3) at a circulation rate of about 800 l/h, at 150°C, and a partial isobutylene pressure of about 300 torr. The experimental results obtained (Table 3) show that with a variation of acidity by five orders of magnitude, the dimerization rate varies by the fivefold only. The degree of dimerization (with respect to isobutylene) amounts to 1.6 on silicon zirconium- and aluminosilicate catalysts at 150°C. This low dependence of the reaction rate on acidity shows that the isobutylene adsorbed on the catalyst surface is almost completely "protonized" (Table 4). A comparison with data from publications concerning the dimerization of isobutylene on phosphoric acid films leads to the assumption that the "protonization" of the adsorbed isobutylene takes place more readily than that of the dissolved one.

G. K. Boreskov is finally thanked for his discussions. B. A. Kazanskiy, M. I. Rozengard, and N. M. Chirkov are mentioned in the text. There are 4 figures, 4 tables, and 13 references: 7 Soviet, 3 US, 2 British, and 1 French.

Card 2/3

Effect of the Acidity of Catalysts on Their
Catalytic Activity I. Polymerization of
Isobutylene

82655
S/195/60/001/001/005/007
B015/B060

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physicochemical Institute imeni L. Ya. Karpov)

SUBMITTED: December 30, 1959

✓

Card 3/3

BORESKOV, G.K.; DZIS'KO, V.A.; PSIKUNOVA, Ye.M.; YUR'YEVA, T.M.

Silicon-boron-tungsten catalyst for the hydration of ethylene. Khim.
prom. no. 2:97-101 F '61. (MIRA 14:4)
(Ethylene) (Hydration) (Catalysts)

S/195/61/002/001/005/006
B101/B216

AUTHORS: Makarov, A. D., Boreskov, T. K., Dzis'ko, V. A.

TITLE: Chemical composition and catalytic properties of silicon-zirconium catalysts

PERIODICAL: Kinetika i kataliz, v. 2, no. 1, 1961, 84-93

TEXT: Basing on the fact that the catalytic properties of oxide mixtures are not additive, the present work studies the chemical nature and catalytic properties of silicon-zirconium catalysts, and whether this deviation from additivity is due to different acceleration of the individual reactions by the components (a view held, e.g., by B. B. Corson, et al., Ref. 1, see below), or to the chemical nature of the catalyst being changed by interaction between the two components. The following catalysts were prepared: (1) Silica gel by hydrolysis of the ethyl ester of orthosilicic acid, and ignition of the precipitate at 500°C; (2) ZrO₂ by precipitation of ZrOCl₂ with NH₃, and ignition of the precipitate at 500°C; (3) mixed catalysts by joint precipitation of ZrOCl₂

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S/195/61/002/001/005/006
B101/B216

Chemical composition and ...

and the orthosilicic acid ester with NH_3 from aqueous-alcoholic solution, hydrolysis of the precipitate, and ignition; component ratios of the mixture and temperature of ignition were varied; (4) mechanical mixtures of the two components. The structure of the Si-Zr catalysts was examined by (A) X-ray analysis. Results obtained were: (a) ZrO_2 crystallizes at $400\text{--}450^\circ\text{C}$ in the tetragonal variety which at 500°C passes over to the monoclinic variety; (b) silica gel ignited at 1000°C is amorphous; (c) jointly precipitated Si-Zr mixtures containing up to 15% SiO_2 after ignition at 500°C exhibited the structure of a solid solution which decomposed after ignition at 1000°C and was re-formed when the temperature dropped below 1000°C . (B) Infrared spectrometric analysis in an IKS-2 (IKS-2) spectrometer in the range $2000\text{--}600\text{ cm}^{-1}$ gave the following results: (a) Silica gel shows absorption bands at 1170 , 1100 , and 810 cm^{-1} ; (b) ZrO_2 one at 735 cm^{-1} ; (c) the spectra of mechanical mixtures were additive; (d) samples obtained by joint precipitation had different spectra

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Chemical composition and ...

than the initial substances: the 735 and 810 cm^{-1} bands disappeared, and new bands appeared at 1060 and 960 cm^{-1} . The formation of an approximately equimolar chemical compound from the two components was established. ZrO_2 contained approximately 0.5% of structure water, silica gel, about 1% , and the jointly precipitated equimolar sample, 3% . Acidity was determined from the color change of an indicator, and the number of acid groups on the surface by titration with butyl amine. Silica gel and ZrO_2 are only slightly acidic, producing a color change of the acid indicator at $\text{pK} = 4$. The $\text{SiO}_2\cdot\text{ZrO}_2$ samples produced a color change at $\text{pK} = -8.2$. The catalytic activity was measured in a continuous-flow apparatus for the following reactions: (I) Preparation of divinyl from a mixture of 72.1% ethyl alcohol, 21.7% acetal, and 6.2% H_2O at 340°C .

Table 1 shows the results obtained with the pure components and their mechanical mixtures, Table 2 the results for $\text{SiO}_2\cdot\text{ZrO}_2$ catalysts, and Table 3 those obtained with these catalysts after treatment with water vapor. (II) Decomposition of ethyl alcohol (Table 4) and isopropyl

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Chemical composition and ...

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alcohol. (III) Condensation of acetal (Table 5). The results obtained were: (a) The non-additive catalytic properties of jointly precipitated Si-Zr catalysts were confirmed. This non-additivity is due to chemical combination of the components. (b) The number of acid groups on the surface of the equimolar sample and its catalytic activity decrease on heating to 800°C. In dehydration of ethyl alcohol, its catalytic activity is proportional to the acidity. (c) The condensation of acetal does not depend on the temperature to which the catalyst was heated. (d) The dehydration of aldol, as of alcohols, takes place at the OH groups on the catalyst surface and, therefore, decreases after ignition of the catalyst. The authors thank L. A. Ignat'yeva and Z. T. Orlova for taking and evaluating the spectra, and M. S. Borisova and M. V. Kostyukova for the acidity measurements. There are 6 figures, 5 tables, and 11 references: 5 Soviet-bloc and 6 non-Soviet-bloc. The references to English-language publications read as follows: B. B. Corson, H. E. Jones, Welling, Hincley, E. E. Stahly, Ind. Eng. Chem., 42, 359, 1950; R. E. Geller, Lang, J. Amer. Ceram. Soc., 32, (12 Part. II) 167, 1957.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
Card 4/11 (Physicochemical Institute imeni L. Ya. Karpov)

Chemical composition and ...

S/195/61/002/001/005/006
B101/B216

SUBMITTED: November 12, 1960

Legend to Table 1: (1) sample number, (2) composition of the catalyst, (3) temperature at which 2-hr heat treatment was performed, °C, (4) yields of main reaction products, mole%; (a) ethylene, (b) hydrogen, (c) divinyl; (5) crystal structure, (6) mechanical mixture, (7) ditto, (8) monoclinic, (9) tetragonal, (10) amorphous, (11) traces.

Таблица 1

Разложение спирто-альдегидной смеси на ZrO_2 , SiO_2 и их механических смесях								
(1) № образ-ца	(2) Состав катали-затора, мол. %		(3) Температура обработки в течение 2 ча-сов при темпе-ратуре, °C	(4) Выход основных продуктов реакции, мол. %			k/S, моль л ² сек	Кристаллическая форма (5)
	ZrO_2	SiO_2		этилен (a)	водород (b)	дивинил (c)		
1	100	—	500	10,0	14,0	5,0	0,4	Моноклинная
2	100	—	450	8,0	13,0	7,0	0,6	Тетрагональная
3	100	—	300	8,5	11,9	6,0	0,5	Аморфная
4	—	100	500	12,0	2,0	21,0	0,08	Аморфная
5	31,4	68,6	(Механиче-ская смесь)	7,0	4,0	Следы (11)	0,1	
6	66,2	33,8	То же	9,0	10,3	3,0	0,3	

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Chemical composition and ...

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Legend to Table 2: (1) sample number, (2) composition of catalyst, (3) heat treatment; (a) temperature, (b) duration, hr, (4) yields of main reaction products, mole%; (a) ethylene, (b) divinyl; (5) crystal structure, (6) amorphous, (7) solid solution.

Разложение спирто-альдегидной смеси на катализе

№ образца	Состав катализатора, мол. %		Температура, °C	Время, час	Выход основных продуктов реакции, мол. %		Структура кристаллов	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
	ZrO ₂	SiO ₂			Этилен	Дивинил				
1	92,5	7,5	425	2	4,0	38,0	2	2	2	2
2	92,5	7,5	500	2	2,0	30,0	2	2	2	2
3	85,0	15,0	435	2	7,0	43,0	2	2	2	2
4	85,0	15,0	500	2	2,5	38,0	2	2	2	2
5	85,0	15,0	1200	2	—	—	2	2	2	2
6	66,2	33,8	700	2	6,0	58,0	2	2	2	2
7	66,2	33,8	750	2	1,5	40,0	2	2	2	2
8	85,0	15,0	500	2	6,0	64,0	2	2	2	2
9	50,0	50,0	500	2	5,0	67,0	2	2	2	2
10	50,0	50,0	800	3	1,5	48,5	2	2	2	2
11	45,0	55,0	500	2	5,0	66,0	2	2	2	2
12	45,0	55,0	800	3	1,5	49,0	2	2	2	2
13	10,0	90,0	500	2	5,0	67,0	2	2	2	2
14	10,0	90,0	850	10	2,5	49,0	2	2	2	2

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	1,8
9	174,0	3,3	3,3	1,9	1,9	1,9	1,9	1,9	1,9	1,9
10	151,0	2,2	2,2	1,5	1,5	1,5	1,5	1,5	1,5	1,5
11	183,0	2,2	2,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
12	148,0	1,6	1,6	1,1	1,1	1,1	1,1	1,1	1,1	1,1
13	134,5	0,9	0,9	0,67	0,67	0,67	0,67	0,67	0,67	0,67
14	109,2	0,5	0,5	0,46	0,46	0,46	0,46	0,46	0,46	0,46

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	1,8
9	174,0	3,3	3,3	1,9	1,9	1,9	1,9	1,9	1,9	1,9
10	151,0	2,2	2,2	1,5	1,5	1,5	1,5	1,5	1,5	1,5
11	183,0	2,2	2,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
12	148,0	1,6	1,6	1,1	1,1	1,1	1,1	1,1	1,1	1,1
13	134,5	0,9	0,9	0,67	0,67	0,67	0,67	0,67	0,67	0,67
14	109,2	0,5	0,5	0,46	0,46	0,46	0,46	0,46	0,46	0,46

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	1,8
9	174,0	3,3	3,3	1,9	1,9	1,9	1,9	1,9	1,9	1,9
10	151,0	2,2	2,2	1,5	1,5	1,5	1,5	1,5	1,5	1,5
11	183,0	2,2	2,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
12	148,0	1,6	1,6	1,1	1,1	1,1	1,1	1,1	1,1	1,1
13	134,5	0,9	0,9	0,67	0,67	0,67	0,67	0,67	0,67	0,67
14	109,2	0,5	0,5	0,46	0,46	0,46	0,46	0,46	0,46	0,46

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	1,8
9	174,0	3,3	3,3	1,9	1,9	1,9	1,9	1,9	1,9	1,9
10	151,0	2,2	2,2	1,5	1,5	1,5	1,5	1,5	1,5	1,5
11	183,0	2,2	2,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
12	148,0	1,6	1,6	1,1	1,1	1,1	1,1	1,1	1,1	1,1
13	134,5	0,9	0,9	0,67	0,67	0,67	0,67	0,67	0,67	0,67
14	109,2	0,5	0,5	0,46	0,46	0,46	0,46	0,46	0,46	0,46

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	1,8
9	174,0	3,3	3,3	1,9	1,9	1,9	1,9	1,9	1,9	1,9
10	151,0	2,2	2,2	1,5	1,5	1,5	1,5	1,5	1,5	1,5
11	183,0	2,2	2,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
12	148,0	1,6	1,6	1,1	1,1	1,1	1,1	1,1	1,1	1,1
13	134,5	0,9	0,9	0,67	0,67	0,67	0,67	0,67	0,67	0,67
14	109,2	0,5	0,5	0,46	0,46	0,46	0,46	0,46	0,46	0,46

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	1,8
9	174,0	3,3	3,3	1,9	1,9	1,9	1,9	1,9	1,9	1,9
10	151,0	2,2	2,2	1,5	1,5	1,5	1,5	1,5	1,5	1,5
11	183,0	2,2	2,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
12	148,0	1,6	1,6	1,1	1,1	1,1	1,1	1,1	1,1	1,1
13	134,5	0,9	0,9	0,67	0,67	0,67	0,67	0,67	0,67	0,67
14	109,2	0,5	0,5	0,46	0,46	0,46	0,46	0,46	0,46	0,46

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	1,8
9	174,0	3,3	3,3	1,9	1,9	1,9	1,9	1,9	1,9	1,9
10	151,0	2,2	2,2	1,5	1,5	1,5	1,5	1,5	1,5	1,5
11	183,0	2,2	2,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
12	148,0	1,6	1,6	1,1	1,1	1,1	1,1	1,1	1,1	1,1
13	134,5	0,9	0,9	0,67	0,67	0,67	0,67	0,67	0,67	0,67
14	109,2	0,5	0,5	0,46	0,46	0,46	0,46	0,46	0,46	0,46

Средняя молекулярная масса

№ образца	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса	Средняя молекулярная масса
1	100,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
2	98,2	5,4	5,4	5,5	5,5	5,5	5,5	5,5	5,5	5,5
3	120,2	6,0	6,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
4	111,0	5,0	5,0	4,5	4,5	4,5	4,5	4,5	4,5	4,5
5	15,0	—	—	—	—	—	—	—	—	—
6	160,2	3,4	3,4	2,1	2,1	2,1	2,1	2,1	2,1	2,1
7	132,0	2,5	2,5	1,9	1,9	1,9	1,9	1,9	1,9	1,9
8	180,0	3,2	3,2	1,8	1,8	1,8	1,8	1,8	1,8	

Chemical composition and ...

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Legend to Table 3: (1) sample number, (2) composition of catalyst, mole%,
(3) yields of main reaction products, mole%; (a) ethylene, (b) divinyl;
(4) heat treatment; (c) temperature, (d) duration, hr, (5) preset
conditions for treatment with water vapor, (6) crystal structure,
(7) resinified, (8) ditto, (9) untreated, (10) solid solution, (11) amorphous,
(12) samples, (13) solid solution.

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Chemical composition and ...

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Таблица 3
Влияние обработки водяным паром на избирательность действия кремнецирконие-
вых катализаторов в реакции распада спирто-альдегидной смеси

① № образца	② Состав катализатора, мол. %		③ Выход основных продуктов, реакци, мол. %		④ Термическая обработка		⑤ Условия обработки водяным паром		⑥ Кристаллическая форма
	ZrO ₂	SiO ₂	этилен ⑤	диэтилен ⑥	температура, °C ⑦	время, час ⑧	температура, °C ⑨	время, мин ⑩	
1	85,0	15,0	Доумоляется		1200 700	2 2	Не обработан		⑦ Твердый р-р
2	85,0	15,0	То же		1200 700	2 2	470	2	
3	50,0	50,0	5,0	67,0	500	2	Не обработан		⑨ Аморфная (образцы 3—11) (11)
4	50,0	50,0	2,5	58,0	700	2	То же		
5	50,0	50,0	4,0	66,0	700	2	470	2	
6	10,0	90,0	5,0	66,0	500	2	Не обработан		
7	10,0	90,0	2,0	57,0	750	5	То же		
8	10,0	90,0	2,0	57,0	750	5	200	6	
9	10,0	90,0	2,5	60,0	750	5	330	2	⑩ Аморфная + твердый р-р (образцы 12—14) (12)
10	10,0	90,0	2,5	62,0	750	5	370	2	
11	10,0	90,0	3,5	66,0	750	5	400	2	
12	10,0	90,0	2,0	50,0	850	10	Не обработан		
13	10,0	90,0	4,0	56,0	850	10	400	2	
14	10,0	90,0	4,0	56,0	850	10	470	2	

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Chemical composition and ...

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Legend to Table 4: (1) sample number, (2) composition of catalyst, (3) heat treatment; (a) temperature, (b) duration, hr, (4) yields of main products, mole%, (c) ethylene + ether, (5) calculated for formation of chemical compound, (6) crystal structure, (7) mechanical mixture, (8) was not determined, (9) inactive, (10) monoclinic, (11) tetragonal, (12) amorphous, (13) samples, (14) solid solution, (15) well crystallized solid solution.

Таблица 4

Разложение этилового спирта при 340°

(1) № образца	(2) Состав катализатора, мол. %		(3) Термическая обработка		(4) Выход основных продуктов реакции, мол. %		(5) A/S-10 ⁴ моль м ² ·сек	(6) A/S-10 ⁴ в расчете на химическое соединение, моль м ² ·сек	(7) Кристаллическая форма
	ZrO ₂	SiO ₂	температура, °C	время, час	этилен+эфир	H ₂			
	(2)	(2)	(3)	(3)	(4)	(4)			
1	100	—	500	2	58,0	33,0	4,2	—	(10) Моноклинная
2	100	—	450	2	57,0	32,0	4,5	—	(11) Тетрагональная
3	100	—	300	2	57,0	34,0	4,7	—	(12) Аморфная
4	31,9	68,1	Механическая смесь		Не определялись		1,0	—	(13) Аморфная
5	—	100	500	2	100	—	0,7	—	

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Chemical composition and ...

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Table 4
CONT.

6	92,5	7,5	425	2	100	—
7	85,0	15,0	435	2	100	—
8	88,1	31,9	500	2	100	—
9	50,0	50,0	500	2	100	—
10	45,0	55,0	500	2	100	—
11	10,0	90,0	500	2	100	—
12	92,5	7,5	500	2	100	—
13	85,0	15,0	500	2	100	—
14	88,1	31,9	750	2	100	—
15	50,0	50,0	800	3	100	—
16	45,0	55,0	800	3	100	—
17	10,0	90,0	850	10	100	—
18	85,0	15,0	1200	2	100	—
			700	2	100	—

Не активен

(7)

8,4	5,5
18	0,0
32	5,0
53	5,3
50	5,5
10	5,0
6,6	4,3
12	4,0
28	4,3
38	3,8
29	3,2
7,0	3,5
—	—

Образцы
6-11: аморфные

Образцы 12-17:
аморфные +
твердый р-р

Хорошо окри-
сталлизованный
твердый
р-р

Card 10/11

Chemical composition and ...

S/195/61/002/001/005/006
B101/B216

Legend to Table 5: (1) sample number, (2) composition of samples, (3) heat treatment, (a) temperature, (b) duration, hr, (4) yield of croton aldehyde at various degrees of conversion, mole%, (5) crystal structure, (6) monoclinic, (7) amorphous, (8) solid solution.

Состав образцов и результаты превращения в табл. 5.

Таблица 5.

Конденсация уксусного альдегида

(1) № образца	(2) Состав образцов, % мол.		(3) Термическая обработка		(4) Выход акронового альдегида при различных степенях превращения, % мол.			(5) Кристаллическая форма
	ZrO ₂	SiO ₂	(a) температура, °C	(b) время, час	10	25	35	
1	100	—	500	2	100	87,0	50,0	8,25 Моноклинная
2	—	100	500	2	100	91,0	78,0	0,4 Аморфная D
3	10,0	90,0	500	2	100	92,0	80,0	9,6 Аморфная I
4	10,0	90,0	850	10	100	80,0	—	9,2 Твердый p-p+аморфная
5	55,0	45,0	500	2	100	94,0	78,0	49,0 Аморфная
6	85,0	15,0	500	2	—	70,0	62,0	61,0 Твердый p-p+аморфная

Card 11/11

S/020/61/136/001/026/037
B004/B056

AUTHORS: Boreskov, G. K., Corresponding Member AS USSR, Dzis'ko, V.A.,
and Tyulikova, T. Ya.

TITLE: The Effect of Water and Oxygen on the Polymerization of
Ethylene Upon Chromium Oxide Catalysts

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1,
pp. 125-128

TEXT: Greatly differing data of the efficiency of chromium oxide catalysts in ethylene polymerization (Refs. 1-3) gave rise to the present paper. Impurities are assumed to have an effect. The present paper gives an account on the effect of water and oxygen on polymerization. The catalyst was made of aluminosilicate carrier, bulk weight 0.43, pore radius 40-60 Å, surface 300 m²/g. This base was impregnated by chromic acid, dried at 110°C, heated to 250°C, and activated by 4 hours' heating to 400°C at 10⁻³ torr. The finished catalyst contained 5% CrO₃. Primarily, experiments were made with extremely pure ethylene. Purity was attained by

Card 1/4

The Effect of Water and Oxygen on the Polymerization of Ethylene Upon Chromium Oxide Catalysts

S/020/61/136/001/026/037
B004/B056

✓

passing C_2H_4 at a pressure of 50 atm through carbon filters, through a column with nickel-chromium catalyst (for O_2 removal), and through columns with active Al_2O_3 (removal of water). The solvents, $\bar{L}P-1$ (BR-1)-type gasoline, cyclohexane or heptane were also freed from water and oxygen by Al_2O_3 and blowing-through of N_2 . Purified C_2H_4 contained about 5 parts-per-million O_2 and H_2O , the solvents contained about 5 parts-per-million H_2O . Polymerization took place in a stainless steel autoclave of 1 liter volume. Special measures (breakoffski for catalyst-containing ampoule, magnetic mixer) prevented access of impurities during the reaction. Processing was as follows: Heating of autoclave to $200^\circ C$, evacuation for two hours, cooling down to $100^\circ C$, repeated blowing-through of pure C_2H_4 . Subsequently, 300 g of purified solvent were pressed into the autoclave by means of N_2 , followed by C_2H_4 addition up to a pressure of 35 atm.

Curves I of Fig. 2 (polymer yield versus catalyst concentration) and Fig.3

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. The Effect of Water and Oxygen on the Polymerization of Ethylene Upon Chromium Oxide Catalysts

S/020/61/136/001/026/037
B004/B056

(efficiency of the catalyst versus its concentration) illustrate the results obtained with pure C_2H_4 . Curves II were obtained for higher water content (20 parts-per-million). Fig. 4 shows the effect of oxygen upon the efficiency of the catalyst. It is assumed that the impurities are adsorbed on the catalyst and thus obstruct its activity centers. The authors thank B. A. Lipkind, Chief Engineer of the Gor'kovskaya baza NIINP (Gor'kiy Base of the Scientific Research Institute of the Petroleum Industry) for supplying the carrier samples. There are 4 figures and 3 references: 2 Soviet and 1 Belgian.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Institute of Physical Chemistry imeni L. Ya. Karpov)

SUBMITTED: August 17, 1960

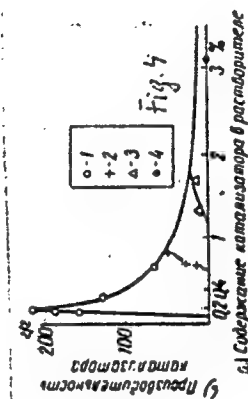
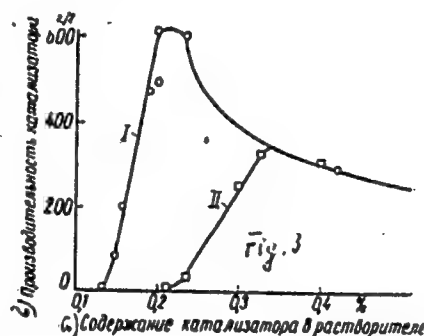
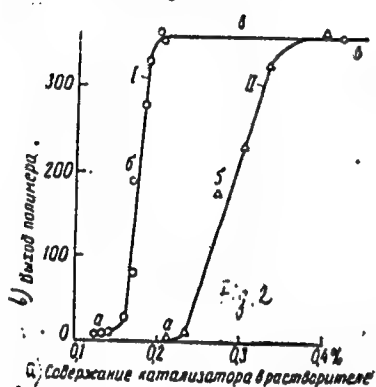
Legend to Fig. 2: I: Water content in the solvent 5 parts-per-million. II: Water content in the solvent 20 parts-per-million; a) content of catalyst in the solvent, b) polymer yield.

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S/020/61/136/001/026/037
B004/B056

Legend to Fig. 3. I: Water content in the solvent 5 parts-per-million;
II: water content in the solvent 20 parts-per-million; a) content of
catalyst in the solvent, b) efficiency of the catalyst.

Legend to Fig. 4. Oxygen content in ethylene 1: 0.0003%; 2: 0.001%,
3: 0.01% 4: 0.1%; a) content of catalyst in the solvent, b) efficiency of
the catalyst.



Card 4/4

S/020/62/143/005/014/018
B101/B110

AUTHORS: Yermakov, Yu. I., Boreskov, G. K., Corresponding Member
AS USSR, Dzis'ko, V. A., and Ivanova, L. I.

TITLE: Low-temperature polymerization of ethylene on chromium oxide
catalyst

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 5, 1962,
1139-1141

TEXT: The polymerization of ethylene at 75°C, i.e., below the m.p. of the polymer, on a chromium oxide catalyst, whose preparation has been described earlier (DAN, 136, no. 1, 125 (1961)), is discussed. The experiments were made with high-purity C₂H₄ (1-2 ppm O₂, 3 ppm H₂O) in purified n-heptane at constant pressure (5-15 atm). The following results were obtained (Fig. 1): (1) an induction period was observed (30-150 min), which was shorter at higher pressure and higher concentration of the catalyst; (2) after the induction period the reaction rate remained constant for a long time (at low catalyst concentration up to

Card 1/3

Low-temperature polymerization ...

S/020/62/143/005/014/018
B101/B110

20 hrs); (3) the polymer consisted of 0.2 to 3 mm large granulae; (4) the initial grains of the catalyst had a size of 0.5 to 1 mm. Catalyst particles of 1-10 μ were found on the surface (not in the bulk) of the polymer grains; (5) a threshold concentration of the catalyst exists below which there is no polymerization. Hence no polymerization occurred with 0.0274% catalyst in the solvent, and a slight polymerization with 0.0325%; (6) the activity, A, of the catalyst, depends on the pressure, P; $A = aP^n$ (a, n = constants). At < 9 atm, $n \sim 2$, at 11-15 atm, $n \sim 3$; (7) the molecular weight, MW, is independent of the catalyst concentration, but depends on P: at 9 atm, the MW was 110,000-125,000, at 15 atm, the MW was 400,000-600,000; (8) a maximum yield (1800 g polyethylene per g catalyst) was obtained at 15 atm and 0.0520% catalyst concentration. There are 4 figures and 1 table.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova
(Physicochemical Institute imeni L. Ya. Karpov)

SUBMITTED: January 11, 1962

Card 2/3

Low-temperature polymerization ...

S/020/62/143/005/014/018
B101/B110

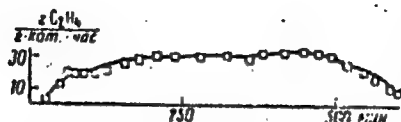


Fig. 1: kinetic curve of C_2H_4 polymerization at 9 atm, $75^\circ C$, catalyst concentration 0.336%. Legend: abscissa time, min; ordinate $g C_2H_4 / g catalyst \cdot hr$.

Card 3/3

DZIS'KO, V.A.; BORISOVA, M.S.; KOTSARENKO, N.S.; KUZNETSOVA, E.V.

Effect of the acidity of oxide catalysts on their catalytic activity. Part 2: Dehydration of isopropyl alcohol. Kin.i
kat. 3 no.5:728-733 8-0 '62. (MIRA 16:1)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR.
(Isopropyl alcohol) (Dehydration (Chemistry))
(Catalysis)

BORISOVA, M.S.; DZIS'KO, V.A.; CHEREDNIK, Ye.M.

Effect of the acidity of oxide catalysts on their catalytic activity. Part 3: Dimerization of propylene. Kin.i kat. 3
no.5:734-741 S-0 '62. (MIRA 16:1)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Fiziko-
khimicheskiy institut imeni Karpova.
(Propene) (Polymerization) (Catalysis)

YERMAKOV, Yu.I.; BORESKOV, G.K.; DZIS'KO, V.A.; IVANOVA, L.I.; TRIFONOV,
A.S.

Polymerization of ethylene on a chromia catalyst without a sol-
vent. Khim.prom. no.7:496-498 J1 '63. (MIRA 16:9)

BORISOVA, M.S.; DZIS'KO, V.A.; IGNAT'YEVA, L.A.; TIMOFEYEVA, L.N.

Acidity of hydroxyl groups of oxide catalyst surfaces
studied by means of infrared spectroscopy. Kin. i kat. 4 no.3:
461-466 My-Je '63. (MIRA 16:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova,
fizicheskiy fakul'tet i Fiziko-khimicheskiy institut imeni
Karpova.

(Catalysts) (Hydroxyl group)
(Spectrum, Infrared)

L 1C702-63

ACCESSION NR: AP3002024

EWP(j)/EPF(c)/EWT(m)/BDS--ASD--Pc-1/Pr-1--RM/WW

5/0195/63/004/003/0492/0494

AUTHOR: Bukanayeva, F. M.; Borekov, G. K.; Dais'ko, V. A.

TITLE: Investigation of the chromium oxide catalyst for high polymerization of ethylene

SOURCE: Kinetika i kataliz, v. 4, no. 3, 1963, 492-494

TOPIC TAGS: chromium oxide, CrO sub 3 catalyst, polyethylene, catalyst carrier, activated CrO sub 3

ABSTRACT: The conditions for activating CrO sub 3 for production of polyethylene were investigated: CrO sub 3 concentration, nature of carrier, reactivity with solvents. Pure CrO sub 3 is completely dissociated at 400 degrees, while with 5% CrO sub 3 on silica gel, Al or Mg silicate at the same temperature 90% is still in the hexavalent state and at 800 degrees, 30% of the Cr is still hexavalent. Increasing CrO sub 3 from 5 to 20% on the carrier decreases its activity, apparently because of decrease in dispersibility. CrO sub 3 on a carrier is most rapidly reduced in methycyclohexane, moderately reduced by cyclohexane and n-heptane and least in benzene; pure CrO sub 3 does not react with heptane due to formation of layer Cr sub 2 O sub 3. When activated CrO sub 3 catalyst is treated with solvent,

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L 10702-63

ACCESSION NR: AP3002024

2
polymerization induction period is prolonged (to provide for desorption of solvent-reaction products from catalyst surface), but catalyst activity is actually increased. EPR spectra of activated and of activated cyclohexane-treated catalyst show same signal intensity, presuming same amount of reduction to Cr sup +5. Hence solvent does not participate in formation of active component of the catalyst; catalyst activation is determined by surface combination of the Cr with the carrier. "EPR spectra were taken at the Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, Academy of Sciences SSSR)." Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: Institut kataliza SO AN SSSR (Catalyst Institute, Siberian Department of the Academy of Sciences SSSR)

SUBMITTED: 30Jan63

DATE ACQ: 12Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 005

OTHER: 001

ja/ 

Card 2/2

BORESKOV, G.K.; ~~DZIS'KO, V.A.~~; YEMEL'YANOVA, V.M.; PECHERSKAYA, Yu.I.;
KAZANSKIY, V.B.

Catalytic activity and electron paramagnetic spectra of
molybdenum oxide catalysts for the polymerization of ethylene.
Dokl. AN SSSR 150 no.4:829-832 Jo '63. (MIRA 16:6)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Institut
khimicheskoy fiziki AN SSSR. 2. Chlen-korrespondent AN SSSR
(for Boreskov).

(Molybdenum catalysts--Spectra)
(Polymerization)